



APR 27

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Inventor: Todd Schweitzer)
Serial No: 09/939,543)
Title: WATERTIGHT) G.A.U. 2853
ELECTRODLESS)
IRRADIATION APPARATUS)
AND METHOD FOR)
IRRADIATING PACKAGING)
MATERIALS)
Filed: August 27, 2001)
Examiner: Lam S. Nguyen)
Docket: T-3827)

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CISLO & THOMAS

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APPLICANT'S APPEAL BRIEF

Mail Stop Appeal Brief-Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

Applicant hereby presents in triplicate his appeal brief, pursuant to 37 C.F.R.

Section 1.192. —

REAL PARTY IN INTEREST

The real party in interest in this application is UV Doctor LLC, a California limited liability corporation, having a current address of 3675 W. Teco Avenue, Suite 10, Las Vegas, NV 89118. An assignment to UV Doctor LLC was executed by the Applicant concurrently with the execution of the Declaration of Inventorship and was recorded in the U.S. Patent and Trademark Office on August 27, 2001 at reel 012129, frames 0759 through 0761.

RELATED APPEALS AND INTERFERENCES

There are no related appeals or interferences.

STATUS OF THE CLAIMS

This appeal is taken with respect to the rejection of Claims 1, 4-5, and 8-11. Claims 1, 4, 5, and 8-11 were first rejected by the Examiner in the Official Action dated February 3, 2003. All of Claims 1, 3-5, and 8-11 were rejected by the Examiner in a second Official Action dated July 25, 2003, which action was made final. This appeal is taken with respect to Claims 1, 4-5, and 8-11, set forth in Appendix A hereto. Claims 2, 6, and 7 have been objected to as being dependent upon a rejected base claim, but the Examiner has indicated that these claims would be allowable if rewritten in independent form including all of the limitations the base claim and any intervening claims. Claim 3 is the subject of an Amendment submitted concurrently herewith. No other claims have been filed in this application.

STATUS OF AMENDMENTS

One amendment filed subsequent to the Examiner's final rejection of July 25, 2003 to correct an error in the dependency of Claim 3 is being submitted concurrently herewith. This amendment is being made to change the dependency of Claim 3 from Claim 1 to Claim 2. Claim 2 contains an antecedent recitation of the baffle that is referred to Claim 3. In the first Official Action dated February 3, 2003, the Examiner stated that Claim 3 would be allowable if amended to depend from Claim 2. It is believed that with the change in dependency of Claim 3, that claim is no longer indefinite and that the claim rejection of Claim 3 under 35 U.S.C. § 112 is no longer warranted. Since it is only now being submitted there has been no action upon this contemporaneous amendment.

SUMMARY OF INVENTION

With reference to the application drawings, Applicant's invention as defined in apparatus Claims 1 and 5 is directed to an irradiation apparatus 10 particularly suitable for irradiating packaging materials to neutralize harmful bacteria. The apparatus 10 is comprised of a NEMA 4 water-tight housing 12 that forms an enclosure with a floor 22 in which an irradiation window opening 32 is defined. A quartz window 40 is disposed across the window opening 32 in water-tight sealed engagement therewith. A microwave excited radiation generator 26 is positioned within the water-tight housing 12 proximate the window opening 32 to emit ultraviolet radiation through the quartz window 40 to an area at the exterior of the housing beneath the quartz window 40. A reflector 30 is positioned within the enclosure relative to the microwave excited ultraviolet radiation generator 26 to focus ultraviolet radiation therefrom on the quartz window 40 (Specification, page 8, lines

10-12).

An air inlet duct 46 to the housing 12 directs cooling air toward the electrodeless lamp 28. The electrodeless lamp 28 produces ultraviolet radiation. An air outlet duct 48 from the housing 12 withdraws air that has passed the electrodeless lamp 28.

The independent method claim of the application is directed toward a method of irradiating articles of packaging to neutralize harmful bacteria. As disclosed in the specification this method of treatment is particularly useful in sanitizing food packaging products, such as that indicated at 44 in the application drawings (Specification, page 1, line 11 to page 2, line 1). The irradiation apparatus 10 that is utilized in the performance of the method includes a NEMA 4 watertight housing 12 that forms an enclosure and has a floor 22 in which an irradiation window opening 32 is defined. A quartz window 40 is disposed across the window opening 32 in watertight sealed engagement therewith. A microwave excited ultraviolet radiation generator 26 that includes an electrodeless lamp 28 that produces ultraviolet radiation is positioned within the watertight housing 12 proximate the window opening 32 to emit ultraviolet radiation through the quartz window 40 to an irradiation treatment area at the exterior of the housing 12 beneath the quartz window 40. This irradiation treatment area is shown in the drawings as the portion of the conveyor belt 42 occupied by the article of packaging 44. The irradiation apparatus 10 also includes an air inlet duct 46 to the housing 12 and an air outlet duct 48 from the housing 12.

The steps of the method of independent Claim 9 comprise: conveying food packaging through the irradiation treatment area, as indicated by the directional arrow beneath the conveyor belt 42 in Fig. 1, and concurrently providing power to the

electrodless lamp 28 to irradiate the food packaging 44 to neutralize harmful bacteria thereon (Specification, page 13, lines 15-17). These steps are performed while focusing radiation from the electrodless lamp 28 onto the quartz window 40 (Specification, page 8, lines 10-12).

ISSUES

1. Are Claims 1, 4, 5, 8, and 9-11 obvious, and therefore unpatentable, under 35 U.S.C. § 103(a) considering the Kolb et al reference (U.S. Patent No. 5,613,509) in view of the Bach reference (U.S. Patent No. 5,894,130).

GROUPING OF CLAIMS

Applicant considers all of the claims on appeal to reside within a single group.

ARGUMENT

The Kolb et al Reference, U.S. Patent No. 5,613,509

The Kolb et al reference is directed to a system for removing coatings and contaminants from a substrate (Kolb et al, col. 6, lines 2-3). More specifically, the Kolb et al system is designed to remove paint from the surfaces of frangible substrates, such as plastic, aluminum, and carbon epoxy (Kolb et al, col. 6, lines 11-13). To do this Kolb et al employs a photoflash system utilizing a broadband xenon flash lamp 14 mounted in the housing 12 (Kolb et al, col. 6, lines 44-51). The flash lamp 14 is positioned within a fused quartz water jacket 61. As stated by Kolb, the light intensity of light energy 18 is in the range of 18-25 joules per square centimeter (Kolb et al, col. 8, lines 21-25).

Pulse energy of this intensity can be achieved with a pulsed energy xenon flash lamp radiation source of the type utilized in Kolb et al (col. 10, lines 18-35). Pulsed light

of this energy is sufficiently great to initiate the ablation/pyrolysis of the layers 24 and 26 of the target area in Kolb et al (col. 8, lines 19-22). However, such a high energy source necessarily requires considerable cooling. The Kolb et al flash lamp 14 and reflector 16 are cooled with deionized water having a temperature of about 50°F supplied at a rate of about two gallons per minute from a water supply to housing 12 through inlet tube 58 and returned through outlet tube 59 (Kolb et al, col. 9, lines 52-67).

It should be noted that the housing 12 itself is not watertight and does not lend itself to air cooling. Only the lower housing 52 (Fig. 2) forms a watertight structure (Kolb et al, col. 9, lines 51-67). A gasket 56 is interposed between the upper and lower housings 50 and 52 to keep moist air from penetrating chamber 51 in the upper housing 50 (Kolb et al, col. 8, lines 53-55). Consequently, the coolant for the optical energy source 14 in Kolb et al is deionized water which emanates from the inlet tube 58, fills the cavity 64, and leaves through the outlet tube 59 (Kolb et al, col. 9, lines 52-56).

The Bach Reference, U.S. Patent No. 5,894,130

The Bach reference discloses use of an ultraviolet sterilization unit 10 for killing bacteria in the air in a forced air heating and cooling system. The ultraviolet sterilization unit 10 is inserted into the cool air return 12 of the air heating and cooling system A. It is also contemplated that the ultraviolet sterilization unit 10 may be placed in other locations within system A, including the connection 14 between the cool air return 12 and the heating/cooling unit 16 (Bach, col. 4, lines 53-61). The Bach system does not employ any type of reflector, nor does it employ a quartz window.

The Bach system goes to considerable length to ensure that ultraviolet light

radiation is not visible externally of the cool air return 12 in which the lamp cartridges 22 and 24 are installed. Bach specifically states “when the lamp cartridges 22(24) are removed, the ultraviolet lamps 26(28) are de-energized.” This to prevent ultraviolet rays from being radiated to a user viewing the ultraviolet lamps 26 and 28 (col. 6, lines 29-39). Also, the Bach system not only fails to provide a reflector for focusing ultraviolet light, but to the contrary specifically avoids focusing and attempts to provide a broad coverage of sterilization within the air ducts (col. 6, lines 8-15).

The Combination of Kolb et al and Bach

A very important feature of all of the claims on appeal is the provision of a NEMA 4 watertight housing within which the microwave excited ultraviolet radiation generator is positioned. This feature appears in all of the independent claims of the application. The significance of the necessity for a NEMA 4 watertight housing is described in the Specification at page 2 from line 1 to line 13. That is, because the irradiation apparatus of the invention and the method of irradiating articles of packaging to neutralize harmful bacteria must be capable of being washed down with water and other liquid cleansers, the irradiation equipment of the invention must be housed within an enclosure having a watertight NEMA 4 rating.

The Examiner relied upon combination of references in rejecting the broadest claims of Applicant’s invention. Specifically, the Examiner took the position that the Kolb et al reference disclosed all of the claim elements of the claims on appeal with the exception of a microwave excited ultraviolet radiation generator that includes an electrodeless lamp and a cooling air inlet and outlet. The Examiner states that the Bach reference discloses

such a microwave excited ultraviolet radiation generator which is cooled by directing cooling air toward the electrodeless lamp 26 and withdrawing from the housing air that has passed the electrode lamp.

To assemble the structural components of independent apparatus Claims 1 and 5, and the apparatus employed in the method of independent Claim 8 utilizing the various elements disclosed in the Kolb et al and Bach system one would either have to take certain elements from the Bach system and employ them in the housing structure of the Kolb et al reference, or utilize the reflector, quartz window, and watertight lower housing 52 disclosed in Kolb et al to surround the microwave excited ultraviolet radiation lamps 26 and 28 in the Bach reference. However, there is no suggestion in either reference to make such substitutions and reconstructions of the devices shown in Kolb et al and Bach. Moreover, even if one were to make these substitutions, the resultant systems would be inoperable for the intended purposes taught in the references.

More specifically, if one were to substitute one of the ultraviolet lamps 26 or 28 disclosed in Bach for the flash lamp 14 in the system of Kolb et al and to substitute a flow of air past the substituted ultraviolet lamp 26 for the flow of distilled water through the inlet and outlet tubes 58 and 59 in Kolb et al, the resultant system would not only fail to operate for the purpose for which the Kolb et al system is designed, but would immediately self-destruct.

The entire purpose of the Kolb et al system is to provide enough energy to initiate the oblation/pyrolysis of substantial amounts of layers 24 and 26, such as paint, from a

frangible substructure 28, such as plastic, aluminum, and carbon epoxy (Kolb et al, col. 6, lines 12-13 and 24-30, and col. 8, lines 19-21). As stated in Kolb et al, for most material expected to be removed by the process, the light energy 18 should generally be in the range of 18 to 25 joules per square centimeter at a full width, half maximum (FWHM) pulse, between 1,000 - 2,000 microseconds and time to peak of about one millisecond (col. 8, lines 21-27). However, the Westinghouse Corporation SlimLine STERILAMP suggested in Bach (col. 5, lines 13-25), or any other microwave excited ultraviolet radiation generator could not produce nearly the requisite energy required by Kolb et al (col. 8, lines 23-25) to burn or ablate a substance such as paint from a substrate. This is the whole purpose of the Kolb et al system. The STERILAMP is a low power UV system and would supply only about 150 millijoules of energy per square centimeters, which is less than 1% of the energy required to perform the paint removal contemplated by Kolb et al. There would therefore be no reason for a person of ordinary skill in the art to make such a substitution.

As held by the Court of Appeals for the Federal Circuit in In Gillette Co. v. S.C. Johnson & Son Inc., 16 USPQ 2d 1923 (CAFC 1990):

"Determination of obviousness under 35 USC 103 requires analysis of claimed invention as whole, and focusing on obviousness of substitutions and differences, instead of on invention as whole, is legally improper way to simplify that determination, nor should "obvious to try" be equated with obviousness."

In the case of W. L. Gore and Associates, Inc. v. Garlock, Inc., 220 USPQ 303 (CAFC 1983). The Court of Appeals for the Federal Circuit held:

"There must have been something present in teachings in references to suggest to one skilled in art that claimed invention before court would have been obvious."

In Ex Parte Garrett, 132 USPQ 514 (BPA&I 1962) the Board held:

"It is improper to rebuild reference, in light of applicant's disclosure, in order for it to operate in a manner never intended or contemplated by reference."

One of ordinary skill in the field of material removal by pyrolyzation or ablation (Kolb, col. 1, lines 12-21) would not be motivated to substitute the Bach ultraviolet lamps 26 and 28 for the much higher energy pulsed flash lamp 14 employed in Kolb et al., since to do so would make the system unsatisfactory for its intended purpose.

Furthermore, the STERILAMP is a very low power output UV bulb. If one were to substitute the STERILAMP ultraviolet lamp 26 of Bach for the flash lamp 14 in the Kolb et al system, and then substitute air for water as a cooling fluid through the inlet and outlet ducts 58 and 59 to the lower housing 52, the result would be a system not only unsuitable for removing paint, but also unsuitable or impractical for the germicidal process of disinfecting food packaging on the other side of the quartz window with the STERILAMP in the position indicated at 14 in the Kolb et al reference. A totally insufficient amount of UV radiation would travel the distance indicated and pass through the quartz window to disinfect food packaging because the STERILAMP would not supply the necessary power.

The quartz window is required in Applicant's invention to allow UV radiation to leave the NEMA 4 watertight housing 12. No quartz window is employed in the Bach

system since it is the object of that system to irradiate the air flowing past the ultraviolet lamps 26 and 28, not a location outside the cool air return 12. Indeed, the Bach system is specifically designed to confine the UV radiation within the cool air duct 12 (Bach, col. 6, lines 30-40). While Bach employs light pipes 58,60 in the wall of the cool air return (Bach, col. 5, lines 56-60), these light pipes are not for the same purpose as a quartz window. That is, they would not allow the passage of UV radiation since Bach attempts to avoid the escape of UV radiation from within the confines of the duct (Bach, col. 3, lines 37-41).

Moreover, the cooling system of Kolb et al would be inadequate if air were substituted for deionized water as the coolant. The cooling system of Kolb et al employs inlet tube 58 and outlet tube 59 designed to supply cooling water of about two gallons per minute (Kolb et al, col. 9, lines 52-55). If one were to instead circulate a comparable volume of air through the lower housing 52 through the inlet tube 58 and outlet tube 59 the resultant system would be impractical because it would overheat. The volume of air circulated through the lower housing 52 cannot be increased enough to provide adequate cooling due to the constrictive effect of the quick disconnect fittings and the small volume of the lower housing taught by Kolb et al (col. 8, lines 57-64; col. 9, lines 28-30). An electrodeless lamp powerful enough to irradiate food through the quartz window 20 of Kolb et al would simply overheat due to inadequate cooling, if air, rather than water were used as the coolant. A person of ordinary skill in the art of irradiating bacteria using UV radiation would therefore not make such a substitution in the Kolb et al system.

As held in Ex Parte Rosenfeld, 130 USPQ 113 (1961):

"References are improperly combined inasmuch as examiner's proposed modification of one reference is directly contrary to specific limitation in reference and would render device of reference unsatisfactory for its intended purpose; one skilled in art would not modify such device to make it unsuitable for its intended purpose".

Also, as held in In Re Rothermel & Waddell, 125 USPQ 329 (CCPA 1960):

"Claims were rejected by what appears to be a piecemeal reconstruction of prior art patents in light of applicants' disclosure; it is easy to attribute to prior art the knowledge which was first made available by applicants and then to assume that it would have been obvious to one having ordinary skill in the art to make these suggested reconstructions, but this is not the type of rejection which statute authorizes."

An inoperable system would also result if one were to encase the ultraviolet lamps 26 and 28 in the system of Bach in the waterproof lower housing 52 of the Kolb et al reference with its quartz window 20. Such an arrangement would fail to perform the function of Bach which is the destruction of bacteria and other microorganisms in the air (Bach, col. 1, lines 22-23). As stated by Bach, in order for ultraviolet rays to kill bacteria, etc., the rays must directly strike the microorganisms (col. 1, lines 38-39). The system of Bach is designed for use in air heating and cooling systems to make the air passing through system ducts free from bacteria (col. 1, lines 47-52). Bach specifically provides that ultraviolet lamps 26 and 28 are in an offset relationship from each other, i.e., they are not

in the same plane. This is done so as to provide a broader coverage of sterilization within the air ducts (col. 6, lines 8-15).

If one were to encase the ultraviolet lamps 26 and 28 within the watertight lower housing 52 of Kolb et al, only the air flowing past the quartz window 20 would be irradiated. The reflector 16 of Kolb et al would prevent radiation from reaching any portion of the flowing air except that portion of the air flowing past the quartz window 20. As a consequence, the system would then fail to perform its intended purpose of exposing the maximum amount of air possible in the air heating and cooling systems to ultraviolet radiation (Bach, col. 1, lines 47-60).

As held by the Court of Appeals for the Federal Circuit in In re Lee, 61 USPQ2d 1430, at pp. 1432 - 1433:

“The essential factual evidence on the issue of obviousness is set forth in Graham v. John Deere Co, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966) and extensive ensuing precedent... When patentability turns on the question of obviousness, the search for an analysis of the prior art includes evidence relevant to the finding of whether there is a teaching, motivation, or suggestion to select and combine the references relied on as evidence of obviousness. See. e.g., McGinley v. Franklin Sports, Inc., 262 F.3d 1339 1351-5, 60 USPQ2d 1001. 1008 (Fed. Cir. 2001) ("the central question is whether there is reason to combine [the] references." a question of fact drawing on the Graham factors).

"The factual inquiry whether to combine references must be

thorough and searching." *Id.* It must be based on objective evidence of record. This precedent has been reinforced in myriad decisions, and cannot be dispensed with. See, e.g., *Brown & Williamson Tobacco Corp. v. Philip Morris Inc.*, 229 F.3d 1120, 1124-25; 56 USPQ2d 1456, 1459 (Fed. Cir. 2000) ("a showing of a suggestion, teaching or motivation to combine the prior art references is an 'essential component of an obviousness holding' ") (quoting *C.R. Bard, Inc. v. M3 Systems, Inc.*, 157 F.3d 1340, 1352; 48 USPQ2d 1225, 1232 (Fed. Cir. 1998)); *In re Dembiczak*, 175 F.3d 994, 999; 50 USPQ2d 1614, 1617 (Fed. Cir. 1999) ("Our case law makes clear that the best defense against the subtle but powerful attraction of a hindsight-based obviousness analysis is rigorous application of the requirement for a showing of the teaching or motivation to combine prior art references."); *In re Dance*, 160 F.3d 1339, 1343; 48 USPQ2d 1635, 1637 (Fed. Cir. 1998) (there must be some motivation, suggestion, or teaching of the desirability of making the specific combination that was made by the applicant); *In re Fine*, 837 F.2d 1071, 1075; 5 USPQ2d 1596, 1600 (Fed. Cir. 1988) (" 'teachings of references can be combined only if there is some suggestion or incentive to do so.' ") (emphasis in original) (quoting *ACS Hosp. Sys., Inc. v. Montefiore Hosp* 732 F.2d 1572, 1577; 221 USPQ 929, 933 (Fed Cir. 1984))."

Applicant respectfully submits that there is no suggestion, motivation, or any reason for one of ordinary skill in the art to combine the elements of the Kolb et al and

Bach references in the manner proposed by the Examiner. The only basis for making such a combination is found in the disclosure of the present application. However, as held by the Patent Office Board of Appeals in Ex parte Lennox, 144 USPQ 224 (1964):

"References are not combined since there is no suggestion therein that they should or could be combined, absent applicant's disclosure in instant application; on the contrary, claimed combination would bring together portions of diverse patents dealing with different articles to obtain product not contemplated by apparatus disclosed."

In the application of 35 U.S.C. 103 under the analytical approach set forth by the United States Supreme Court in Graham v. Deere, *supra*, the Examiner must identify where the prior art provides a motivating suggestion for the modification. The modification is not obvious unless the prior art suggests the desirability for the modification. For example, in the decision in In re Fritch, 922 F. 2d 1260, 23 USPQ2d 1780 (CAFC 1992), the Court of Appeals for the Federal Circuit held:

"Mere fact that prior art may be modified to reflect features of claimed invention does not make modification, and hence claimed invention, obvious unless **desirability** of such modification is suggested by prior art....It is impermissible to use the claimed invention as an instruction manual or "template" to piece together the teachings of the prior art so that the claimed invention is rendered obvious." [at 1783-1784] [**Emphasis added**]

The Court referred to its own prior decision in In re Gordon, 733 F.2d 900, 221 USPQ 1125 (CAFC 1984) which held at page 1127:

“The mere fact that the prior art may be modified in the manner suggested by the Examiner does not make the modification obvious unless the prior art suggested the **desirability** of the modification.

In addition, it has been held that the motivating suggestion must be **explicit**, as was decided in Winner International Royalty Corp. v. Wang, 11 F. Supp. 2d 18, 48 USPQ2d 1139 (USDC DC 1998), where the Court held:

“...simplicity of device alone is not determinative, since invention cannot be found obvious unless there was some **explicit** teaching or suggestion in art to motivate one of ordinary skill to combine elements so as to create same invention.” [at 1140] [**Emphasis added**]

“...there must have been some **explicit** teaching or suggestion in the art to motivate one of even ordinary skill to combine such elements so as to create the same invention.” [at 1144] [**Emphasis added**]

SUMMARY

For all of the foregoing reasons, Applicant respectfully submits that the Examiner's decision rejecting the claims on appeal, Claims 1, 4-5, and 8-11, should be reversed.

Enclosed herewith is a check in the amount of one hundred sixty-five dollars (\$165.00) for the fee due for filing a brief in support of this appeal in accordance with 37 C.F.R. Section 1.17(c).

Please charge any underpayment or credit any overpayment of fees in connection with this appeal to Patent Office Depository Account 03-2035.

Date: December 16, 2003

Respectfully submitted

A handwritten signature in cursive script, appearing to read "Charles H. Thomas".

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APPENDIX A

CLAIMS

1. An irradiation apparatus comprising:

a NEMA 4 watertight housing that forms an enclosure and which has a floor in which an irradiation window opening is defined,

a quartz window disposed across said window opening in watertight sealed engagement therewith,

a microwave excited ultraviolet radiation generator that includes an electrodeless lamp that produces ultraviolet radiation positioned within said watertight housing proximate said window opening to emit said ultraviolet radiation through said quartz window to an area at the exterior of said housing beneath said quartz window,

a reflector positioned within said enclosure relative to said microwave excited ultraviolet radiation generator to focus ultraviolet radiation therefrom upon said quartz window,

an air inlet duct to said housing for directing cooling air toward said electrodeless lamp, and

an air outlet duct from said housing for withdrawing from said housing air that has passed said electrodeless lamp.

4. An irradiation apparatus according to Claim 1 wherein said floor of said watertight housing is formed of stainless steel and said watertight housing is further comprised of laterally enclosing upright stainless steel walls extending up from said floor and a stainless steel lid to which said air inlet and air outlet ducts are joined.

5. Apparatus for irradiating packaging materials to neutralize harmful bacteria comprising:

a NEMA 4 waterproof housing that forms an enclosure and which has a floor in which an irradiation window opening is defined,

5 a quartz window disposed across said window opening in watertight, sealed engagement therewith,

a microwave excited ultraviolet radiation generator that includes an electrodeless lamp that produces ultraviolet radiation positioned within said watertight housing proximate said window opening to emit said ultraviolet radiation through said quartz window to packaging materials located outside said housing beneath said quartz window,

10 a reflector positioned within said enclosure relative to said microwave excited ultraviolet radiation generator to focus ultraviolet radiation therefrom upon said quartz window,

15 an air inlet duct to said housing for directing cooling air toward said electrodeless lamp, and

an air outlet duct from said housing for withdrawing from said housing air that has passed said electrodeless lamp.

8. An apparatus according to Claim 5 in which said floor of said watertight housing is formed of stainless steel and said housing is further comprised of upright stainless steel walls surrounding said ultraviolet radiation generator and a removable stainless steel lid located atop said upright walls, and said air inlet and said air outlet ducts

5 are joined to said stainless steel lid in perpendicular orientation relative to said floor, and
said housing is further comprised of a compressible, watertight gasket interposed between
said removable lid and said upright walls to maintain a watertight seal therebetween.

9. A method of irradiating articles of packaging to neutralize harmful bacteria
utilizing irradiation apparatus that includes:

a NEMA 4 watertight housing that forms an enclosure and which
has a floor in which an irradiation window opening is defined,

5 a quartz window disposed across said window opening in watertight
sealed engagement therewith,

a microwave excited ultraviolet radiation generator that includes an
electrodeless lamp that produces ultraviolet radiation positioned within said watertight
housing proximate said window opening to emit said ultraviolet radiation through said
10 quartz window to an irradiation treatment area at the exterior of said housing beneath said
quartz window,

an air inlet duct to said housing, and

an air outlet duct from said housing, the steps comprising:

15 conveying food packaging through said irradiation
treatment area, and

concurrently providing power to said electrodeless lamp to
irradiate said food packaging to neutralize harmful bacteria thereon, and

focusing radiation from said electrodeless lamp onto said quartz
window.

10. A method according to Claim 9 further comprising directing cooling air toward said electrodeless lamp.

11. A method according to Claim 10 further comprising withdrawing from said housing air that has passed said electrodeless lamp.